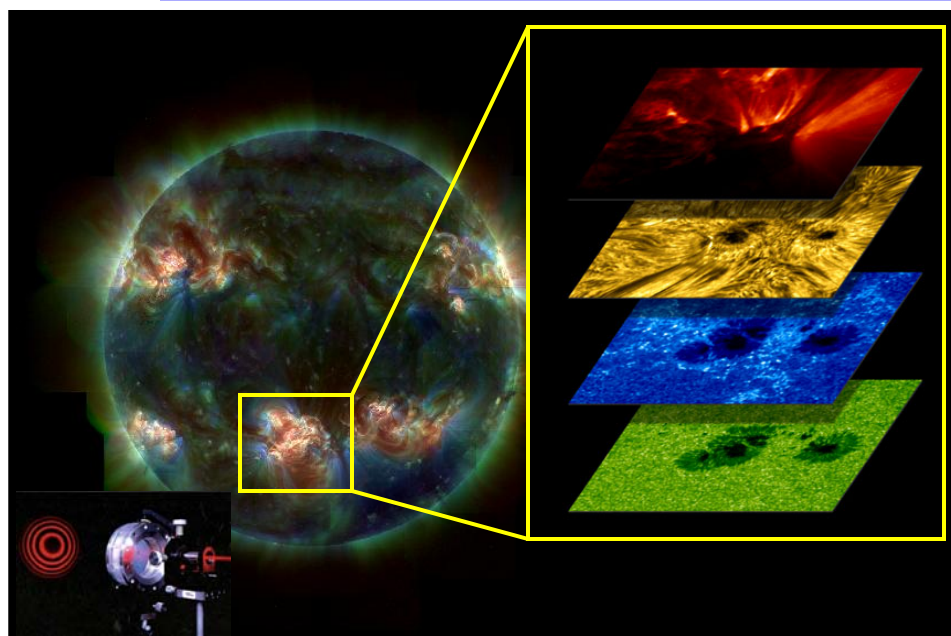




Solar MAgnetized Regions Tomograph (SMART)



Science Objectives:

1. Reveal how magnetic fields extend into the solar corona, where measurements do not exist.
2. Understand when, why, and how is magnetic energy released in solar flares
3. Determine what heats the solar corona

Associated Heliophysics RFAs:

1. RFA F, through F1: reconnection in flares / CMEs.
2. RFA H, through H1: solar causes of space weather
3. RFA J, through J1: extreme space weather, and J2: predictive capability of adverse space weather

Mission Implementation Description:

- One spacecraft at polar, Sun-synchronous (600 km) orbit, with solar-pointed attitude control
- One remote sensing vector magnetograph (TRL 5)
- Relatively light-weight (600 kg), low-power (600W), with a telemetry of approx. 4 Mbps

Measurement Strategy:

Provide the first-ever three-dimensional tomographic magnetic field measurements of solar active regions and the quiet Sun in sufficiently high quality to yield an unprecedented science return

Enabling and Enhancing Technology Development:

- Lithium-niobate, solid, Fabry-Perot etalon filter
- A 50-cm aperture solar optical telescope
- Vector magnetograph able to switch to a number of magnetically sensitive spectral lines formed at different heights in the solar atmosphere
- Small integration time, (a few minutes) to enable nearly simultaneous coverage of the various layers
- High cadence, to enable detailed evolution coverage
- **Previous experience / heritage exists through the balloon-borne Flare Genesis Experiment**